

CLAIMS

What is claimed is:

1. A clutch brake, comprising:

a brake housing adapted to be non-movably secured relative to a driveline master clutch, the brake housing including a through-hole sized to allow passage of a shaft and at least one source of magnetic flux; and

an armature secured for rotation with the shaft and positioned axially adjacent the brake housing in a disengaged state, at least a portion of the armature adapted to move axially on the shaft in the presence of magnetic flux to contact the brake housing in an engaged state and inhibit rotation of the armature and the shaft.

2. The clutch brake of claim 1, wherein the source of magnetic flux includes an electromagnetic coil.

3. The clutch brake of claim 1, wherein the armature includes a shaft collar secured for rotation with the shaft and an armature plate surrounding the shaft collar and movable relative to the shaft and shaft collar in an axial direction.

4. The clutch brake of claim 3, wherein the armature includes a return spring attached to the armature plate and the shaft collar.

5. The clutch brake of claim 4, wherein the armature plate is adapted to move relative to the shaft collar between a first, disengaged position in the disengaged state and a second position engaged with the brake housing in the engaged state.

6. The clutch brake of claim 5, wherein the return spring is adapted to bias the armature plate toward the first, disengaged position when the armature plate is moved toward the second, engaged position.

7. The clutch brake of claim 1, wherein the brake housing includes at least two sources of magnetic flux.

8. The clutch brake of claim 7, wherein the armature includes a number of slots positioned to separate lines of magnetic flux generated by a first source of magnetic flux from lines of magnetic flux generated by a second source of magnetic flux.
9. The clutch brake of claim 1, wherein the brake housing is configured to function as a bearing cap.
10. A driveline clutch assembly, comprising:
 - a master clutch for transmitting rotational power between a prime mover and a transmission input shaft; and
 - a clutch brake, including:
 - a brake housing adapted to be non-movably secured relative to the master clutch, the brake housing including a through-hole sized to allow passage of the input shaft and at least one source of magnetic flux; and
 - an armature secured for rotation with the shaft and positioned axially adjacent the brake housing in a disengaged state, at least a portion of the armature adapted to move axially on the input shaft in the presence of magnetic flux to contact the brake housing in an engaged state to inhibit rotation of the armature and the input shaft.
11. The driveline clutch assembly of claim 10, wherein the source of magnetic flux includes an electromagnetic coil.
12. The driveline clutch assembly of claim 10, wherein the armature includes a shaft collar secured for rotation with the shaft and an armature plate surrounding the shaft collar and movable relative to the input shaft and shaft collar in an axial direction.
13. The driveline clutch assembly of claim 12, wherein the armature includes a return spring attached to the armature plate and the shaft collar.

14. The driveline clutch assembly of claim 13, wherein the armature plate is adapted to move relative to the shaft collar between a first, disengaged position in the disengaged state and a second position engaged with the brake housing in the engaged state.

15. The driveline clutch assembly of claim 14, wherein the return spring is configured to bias the armature plate toward the first, disengaged position when the armature plate is moved toward the second, engaged position.

16. The driveline clutch assembly of claim 10, wherein the brake housing includes at least two sources of magnetic flux.

17. The driveline clutch assembly of claim 16, wherein the armature includes a number of slots positioned to separate lines of magnetic flux generated by a first source of magnetic flux from lines of magnetic flux generated by a second source of magnetic flux.

18. The driveline clutch assembly of claim 10, wherein the brake housing is configured to function as a transmission bearing cap.

19. The driveline clutch assembly of claim 10, wherein the brake housing is adapted to secure a quill to a transmission housing.

20. The driveline clutch assembly of claim 10, further including a release bearing and a release bearing actuating member adapted to move the release bearing to engage and disengage the master clutch.

21. The driveline clutch assembly of claim 20, wherein the master clutch is provided in communication with a control system adapted to control operation of the clutch brake.

22. The driveline clutch assembly of claim 21, wherein the control system includes a control unit and at least one sensor adapted to determine the position of at least one of the release bearing and the release bearing actuating member and provide an output to the control unit indicative of that position.

23. The driveline clutch assembly of claim 22, wherein the sensor is one of an inductive sensor, a Hall Effect switch and a mechanical switch.

24. A combination brake and bearing cap, comprising:

a brake housing adapted to secure a component of a bearing, the brake housing including a through-hole sized to allow passage of a shaft and at least one source of magnetic flux; and

an armature secured for rotation with the shaft and positioned axially adjacent the brake housing in a disengaged state, at least a portion of the armature adapted to move axially on the shaft in the presence of magnetic flux to contact the brake housing in an engaged state to inhibit rotation of the armature and the shaft.

25. The combination brake and bearing cap of claim 24, wherein the source of magnetic flux includes an electromagnetic coil.

26. The combination brake and bearing cap of claim 24, wherein the armature includes a shaft collar secured for rotation with the shaft and an armature plate surrounding the shaft collar and movable relative to the shaft and shaft collar in an axial direction.

27. The combination brake and bearing cap of claim 26, wherein the armature includes a return spring attached to the armature plate and the shaft collar.

28. The combination brake and bearing cap of claim 27, wherein the armature plate is adapted to move relative to the shaft collar between a first, disengaged position in the disengaged state and a second position engaged with the brake housing in the engaged state.

29. The combination brake and bearing cap of claim 28, wherein the return spring is configured to bias the armature plate toward the first, disengaged position when the armature plate is moved toward the second, engaged position.

30. The combination brake and bearing cap of claim 24, wherein the brake housing includes at least two sources of magnetic flux.

31. The combination brake and bearing cap of claim 30, wherein the armature includes a number of slots positioned to separate magnetic lines of magnetic flux generated by a first source of magnetic flux from lines of magnetic flux generated by a second source of magnetic flux.